DIGITAL EDUCATION COUNCIL

AI for Student Engagement

A Global Review of Emerging Strategies

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Executive Summary

AI is reshaping student engagement, a complex and multifaceted field. Yet institutional efforts remain fragmented, with limited clarity on how AI can meaningfully enhance engagement.

This report offers a first comprehensive global review of AI in student engagement. Drawing on 106 case studies, it identifies 24 emerging methodologies across six engagement aspects:

- Faculty Interaction
- Peer Exchange
- Content and Assessment
- Instructional Delivery
- Experiential and Applied Learning
- Environment and Inclusivity

Each methodology is presented with practical guidance: implementation contexts, step-by-step applications, real-world examples, and observed impact.

AI's presence has altered the relational dynamics of engagement. Beyond introducing a new student–AI collaboration it is reshaping traditional relationships between students, faculty, peers, and content. This shift reveals four key opportunities: Deeper Faculty–Student Engagement, Broader Peer-to-Peer Exchange, Richer Student–Content Interaction, Responsible Human-AI Collaboration

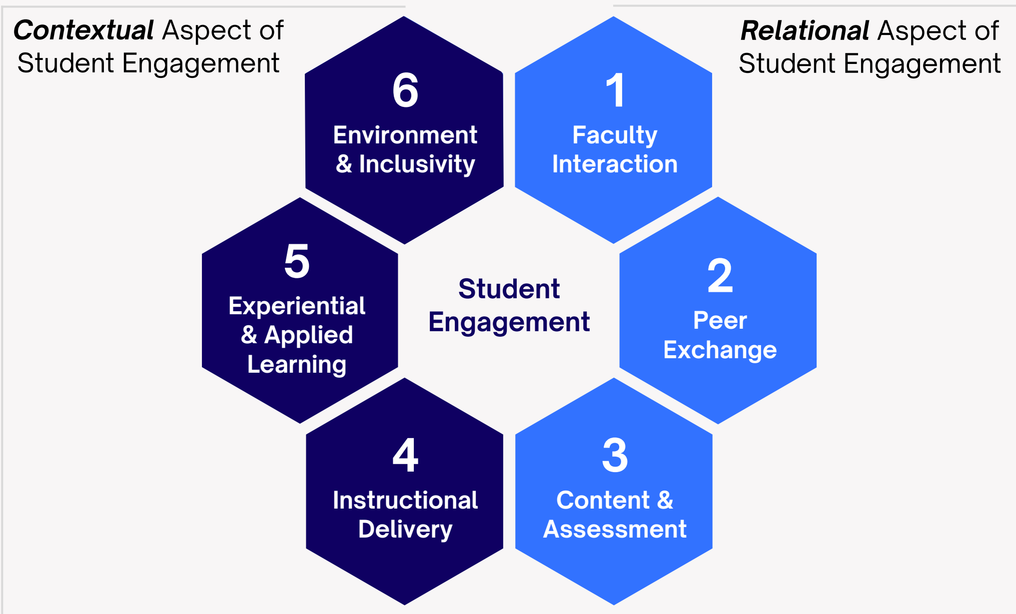
Grounded in global practice, this report provides institutions with a practical guide to rethink student engagement, assess their current AI initiatives, and chart a responsible path for AI adoption and investment.

Unpacking Student Engagement

AI is fundamentally changing how students engage with learning. However, student engagement is a complex and multi-layered field. To understand how AI is reshaping it this report focuses on six key aspects of engagement: how students interact with faculty, peers, and content, as well as how they engage through instructional delivery, applied learning, and the broader learning environment.

While these aspects are highly interconnected each carries its own distinct focus and characteristics. Together, they provide a structured lens through which to analyse innovation in engagement. By mapping emerging uses of AI across these six areas this report highlights where practices are already maturing, where new priorities are taking shape, and where novel ideas are only beginning to surface.

Figure 1. Six Key Aspects of Student Engagement



Faculty Interaction	Student relationship with faculty, including mentorship, guidance, and feedback.
Peer Exchange	Students collaborate, exchange ideas, and construct understanding with one another.
Content & Assessment	Students interact with disciplinary knowledge and structured learning activities.
Instructional Delivery	Students perceive and respond to the clarity, presence, and style of instructional approaches.
Experiential & Applied Learning	Students connect learning to authentic, applied, and immersive contexts.
Environment & Inclusivity	Students feel supported through inclusive and accessible environments.

While the six aspects of engagement provide a useful framework, they do not play out in the same way across every learning context. Engagement looks very different depending on the setting, whether students are on campus or online, and whether interactions happen synchronously or asynchronously.

Innovations in student engagement are likewise not one-size-fits-all. Certain approaches are more effective in particular contexts. To account for this, the report recognises the varied forms of engagement across delivery settings and analyses emerging innovations in relation to the contexts where they are best suited.

This breakdown provides a more nuanced view of how engagement happens in practice and where AI may shape it in distinct ways.

Figure 2. Student Engagement Across Learning Settings

	Synchronous	Asynchronous
On-Campus	**Deepening Human Connection** • Live lectures, seminars, Q&A • Group discussion and problem-solving • Hands-on labs, workshops, and studios • Real-time Q&A and feedback from faculty • Informal peer & faculty interactions	**Guiding Self-Directed Learning** • Reviewing lecture recordings and handouts • Completing pre-class readings or tasks • Independent study • Project work and assignments coordinated outside class • Asynchronous peer collaboration
Online	**Facilitating Active Digital Interaction** • Attending live lectures and webinars • Breakout room group activities • Virtual mentoring sessions • Peer collaboration through shared digital workspaces • Virtual networking and community events	**Sustaining Motivation & Continuity** • Watching recorded lectures at own pace • Participating in forums or discussion boards • Completing self-paced quizzes and interactive exercises • Gamified progress: badges, levels, micro-credentials

The Shifting Landscape of Student Engagement in the AI Era

Planning AI adoption in higher education requires institutions to carefully assess the changes AI introduces, identify key opportunities, and allocate resources strategically.

At its core, student engagement is relational, shaped by the various relationships that make up the overall student experience. Viewed through this lens, AI not only creates a new direct link with students but also reshapes three traditional relationships: students with faculty, students with peers, and students with content. These interactions form the focal point of this report's analysis.

Figure 3. Three Dimensions of Rethinking Assessment in the Age of AI

Relations	Traditional Interaction	Shift to AI
Student–Faculty	**Faculty as Primary Source of Feedback & Guidance** • Students seek feedback from faculty on assignments. • Students ask questions during office hours or via email. Theme: Faculty provide validation, clarification, and expert guidance	**AI as an Instant Responder** • Students receive instant feedback from AI. • Students ask AI for instant responses to questions. Theme: AI replaces the wait for human feedback with immediacy
Student–Peers	**Peers as Support & Perspective-Sharing** • Students ask peers for help with content understanding and assignments. • Students exchange ideas with peers for diverse perspectives. Theme: Peers serve as collaborators and co-learners.	**AI as an Alternative Perspective Source** • Students ask AI for alternative perspectives (instead of peers). • Students use AI for summaries and content explanations. Theme: AI can provide breadth and multiple viewpoints beyond what textbooks or peers might offer.
Student–Content	**Content as Main Learning Medium** • Students read textbooks, attend lectures, and take notes passively. • Students complete assignments independently. Theme: Content consumption and independent study are central.	**AI as a Productivity Tool** • Students use AI to summarise, transcribe, and take notes for lectures. • Students use AI for analysis and problem-solving. Theme: AI handles mechanical and cognitive load, freeing students for higher-order thinking (or potentially resulting in over-reliance).

With capabilities such as generating insights and delivering instant responses, AI increasingly serves as the “front line” of interaction. Students often turn first to AI for feedback, explanations, and support, sometimes bypassing traditional human interactions with faculty and peers. This shift has mixed effects: while AI can improve efficiency and personalise learning, over-reliance may weaken critical engagement with content and diminish meaningful human interaction.

These evolving dynamics highlight the need for intentional pedagogical design, leveraging AI to strengthen, rather than replace, core relationships. When integrated thoughtfully, AI can enrich engagement across all dimensions of the student engagement.

Figure 4. Four Emerging Opportunities in Student Engagement

1
Deeper Faculty–Student Engagement
AI can free faculty from routine tasks, allowing deeper, higher-level interactions and personalised guidance.

2
Broader Peer-to-Peer Exchange
AI can expand collaborative learning opportunities, enabling students to exchange ideas beyond immediate peer groups and exposing students to more diverse perspectives.

3
Richer Student–Content Interaction
AI can provide interactive and personalised access to learning materials, enriching the engagement with content.

4
Responsible Human–AI Collaboration
By guiding students in effective and responsible use of AI, institutions can foster meaningful human–AI collaboration while developing human-centred skills.

Deeper Faculty–Student Engagement

AI has the potential to shift the faculty–student relationship from one anchored in transactions of lecturing, grading, and feedback to one rooted in meaningful connection. By offloading routine tasks to AI, AI allows faculty to dedicate more time to higher-level engagement — mentoring, critical dialogue, and authentic relational building.

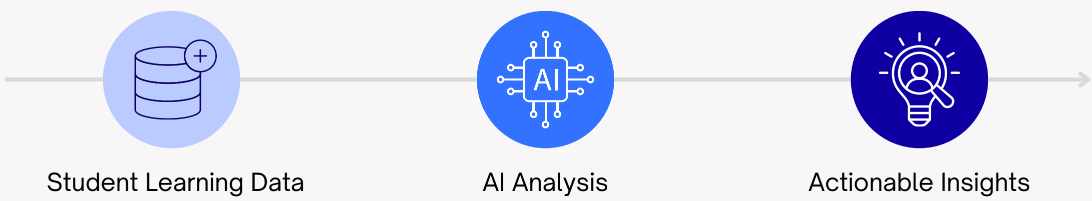
The real opportunity lies in using AI as an *intelligence layer* that reveals patterns of learning and engagement once invisible to faculty:

- **Collecting engagement data** — capture signals from a wide range of learning activities: AI tutor enquiries, in-class participation, and assessment behaviours.
- **Integrating data streams** — connecting fragmented course, assessment, and platform records into a holistic learner profile (“digital twins”).
- **Generating insights** — using AI to surface actionable insights such as students' weak points, suggested teaching materials, personalised pathways, and timely interventions.

Currently, many institutions only capture fragments of this picture. Engagement data is often siloed by course or assessment, limiting AI’s ability to provide faculty with a holistic view.

Figure 5. Student Engagement Across Learning Settings

AI as an **Intelligence Layer** Bridging Student–Faculty Engagement



Broader Peer-to-Peer Exchange

AI can broaden the scope of peer engagement by exposing students to more diverse perspectives and facilitating richer dialogue. Instead of relying only on limited discussion self-preparation and immediate classmates, AI can expand idea generation, widen the circle of exchange, and help students engage with difference more intentionally.

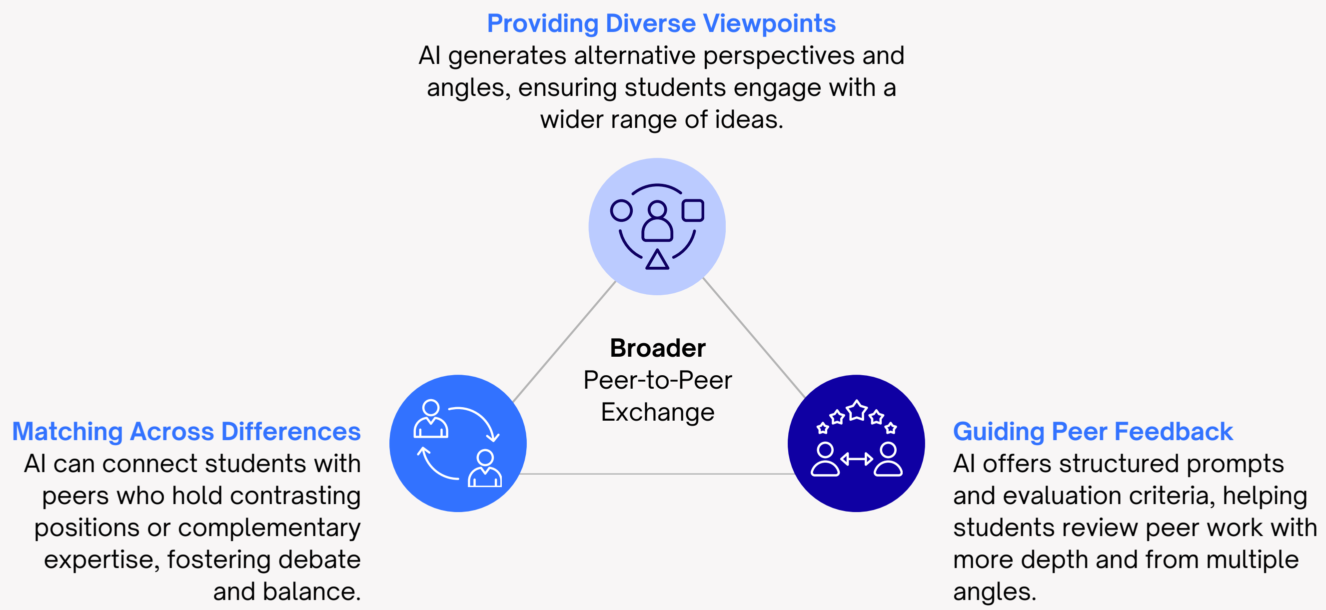
The foundation of this shift rests on three key AI capabilities:

- **Providing diverse viewpoints** — AI generates alternative perspectives and angles, ensuring students engage with a wider range of ideas.
- **Matching across differences** — AI can connect students with peers who hold contrasting positions or complementary expertise, fostering debate and balance.
- **Guiding peer feedback** — AI offers structured prompts and evaluation criteria, helping students review peer work with more depth and from multiple angles.

However, AI's ability to generate insights can be a double-edged sword: while it broadens perspectives, it may also hinder the development of creative and critical thinking skills. Students could use AI tools to generate content without engaging in critical thinking or adding their own insights. This "passive creativity" risks reducing the originality and depth of their work.

Current peer-to-peer learning is still largely bounded by classroom cohorts and lacks strong mechanisms for surfacing contrasting or diverse perspectives. Early experiments with AI, such as peer matching and structured peer feedback support, show promise, but remain exploratory.

Figure 6. Three Key Components of How AI Can Broaden Peer-to-Peer Exchange



Richer Student–Content Interaction

AI is becoming a natural layer in how students engage with learning materials and assessment. Institutions must adapt to this new reality by intentionally designing interactions so that AI enhances learning rather than enabling shortcuts to avoid superficial learning.

Two key areas of innovation are emerging:

1. Interactive engagement with materials

- Embedding AI-driven interaction points within readings, videos, and other resources transforms passive study into active learning. Prompts, explanations, or adaptive questions ensure students are not only consuming content but also critically engaging with it.

2. AI-integrated assessment

- By intentionally embedding AI into assessment tasks, institutions can create activities that are both AI-resilient and skills-enhancing. Students are guided to use AI, developing stronger disciplinary skills while also building AI literacy.

AI-Integrated Assessment

The Next Era of Assessment, a joint report by the Digital Education Council and Pearson, provides the first comprehensive review of how educators worldwide are redesigning assessment with AI.

Drawing on 101 global case studies, the report identifies 14 emerging AI-integrated assessment design methodologies, which enable global educators in building richer student - content interaction using AI.

Responsible Human-AI Collaboration

As students increasingly turn to AI as their first point of interaction for study and problem-solving. According to the *Digital Education Council Global AI Student Report 2024*, 86% of students use AI for their studies. Institutions must take responsibility for guiding this emerging human–AI relationship.

Responsible engagement with AI requires more than technical training. Students must be guided to use AI effectively while developing complementary human capabilities that preserve depth and originality in learning. Three areas are particularly critical.

Digital Education Council Global AI Student Report 2024.

Figure 7. Key AI and Human-Centric Skills for Responsible Human-AI Collaboration

Technical Skill

Understanding AI

Ensure students build a foundational understanding of how AI systems work, the principles of data collection, processing, and interpretation, and the implications of AI-generated output.

Human-Centric Skill

Critical Thinking

Enable students to evaluate AI-generated content, verify sources, detect misinformation, identify biases, and apply logical reasoning when engaging with AI.

Ethical Use of AI

Ensure students understand AI ethics principles, recognise potential risks (such as misinformation and bias), and implement responsible AI use practices.

Human-Centricity and Creativity

Emphasise the importance of human skills such as creativity and emotional intelligence, ensuring students use AI in ways that complement rather than replace human capabilities.

Critical thinking - long a cornerstone of education, has become even more essential in the age of AI. It enables students to verify the quality and accuracy of AI-generated output and assess relevance to their specific needs. While AI can generate valuable insights, the ability to evaluate, question, and refine these outputs is what prevents errors, biases, and superficial solutions from taking hold.

Ethical use of AI - The responsible use of AI requires students to recognise potential risks such as bias, misinformation, and discriminatory outcomes. Developing ethical awareness allows students to interrogate AI outputs, contextualise them appropriately, and apply them responsibly.

Human-centric skill and creativity - As AI increasingly automates routine tasks and mediates interactions, core human capabilities such as communication, empathy, collaboration, and creativity must be reinforced. Institutions should integrate AI in ways that enhance these skills, ensuring that students continue to practice and refine the human dimensions of learning.

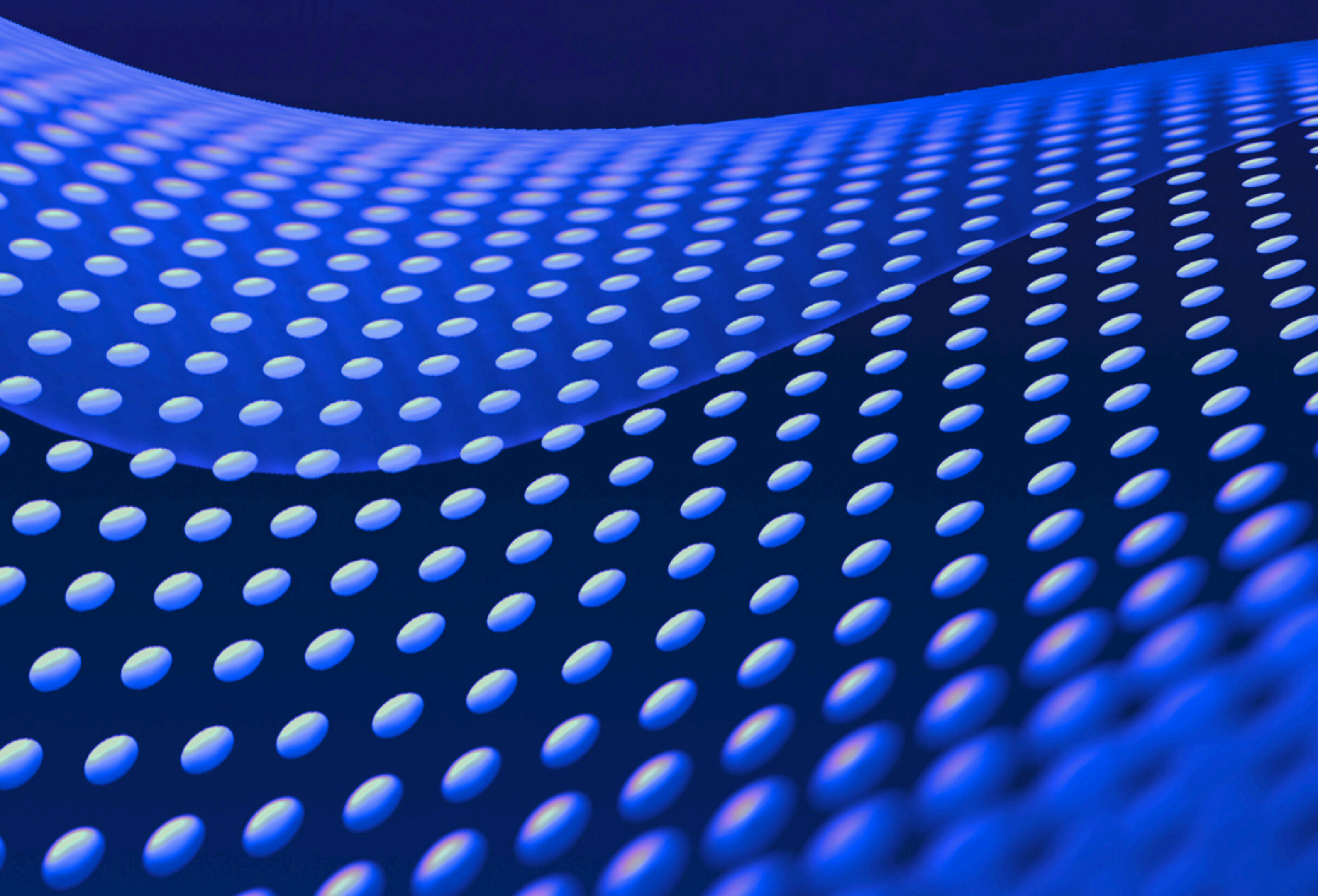
AI Literacy

The Digital Education Council's AI Literacy Framework defines five dimensions of AI Literacy:

- Understanding AI and data
- Critical Thinking and Judgement
- Ethical and Responsible AI Use
- Human-Centricity, Emotional Intelligence, and Creativity
- Domain Expertise

For each dimension, the Framework outlines three competency levels of AI literacy with example competencies and detailed example actions for progression.

The Practical Guide to AI-Enhanced Student Engagement



The Practical Guide to AI-Enhanced Student Engagement

Higher education institutions are increasingly exploring a variety of AI applications aimed at enhancing student engagement. However, the sector remains in an early experimental phase, with numerous pilots and trials underway.

Drawing on 106 global case studies, this section identifies **24 emerging methodologies** for using AI to enhance student engagement, offering a range of approaches that can guide institutions in optimising AI integration in education.

These methodologies provide a snapshot of current practices and experimentation across institutions—ranging from mature, well-established applications to novel approaches that are only beginning to be explored and studied.

Each methodology is presented with practical guidance, including description, implementation contexts, step-by-step applications, real-world examples, observed impact, and key success indicators.

Figure 7. 24 Emerging Methodologies for AI-Enhanced Student Engagement

Faculty Interaction	Peer Exchange	Content and Assessment	Instructional Delivery	Experiential and Applied Learning	Environment and Inclusivity
AI-Enhanced Teaching Assistant	AI-Supported Asynchronous Discussion Board	AI-Generated Multi-Level Explanations	AI-Enhanced Flipped Classroom	AI for Role-Playing	AI Live Captioning, Transcription, Translation
AI-Customised Instructor-Like Feedback	AI-Generated Prompts for Synchronous Discussions	AI-Created Engaging and Relevant Content	Avatar Teaching	Physical Object-Based AI Simulation	AI for Inclusive Content Creation
AI-Enhanced Faculty Feedback	AI-Mediated Peer Discussions	AI Tutor	Adaptive Micro-Learning	AI-Enhanced XR	AI Learning Management Assistant
Predictive Analytics	AI-Moderated Breakout Rooms	AI-Supported Interactive Reading	AI Real-time Instructor Coaching		
		AI Real-Time Feedback for Students			
		AI-Generated Memory Retention Exercises			

AI-Enhanced Teaching Assistant

Description

Using AI as a supplementary tool for Teaching Assistants involves integrating generative AI (e.g., Chat GPT) into TA-led instruction and support sessions. Rather than giving students direct access to AI, TAs use it to enhance teaching efficiency and quality, such as generating exercises, clarifying concepts, providing hints, debugging code, and giving feedback.

- **Suitable Settings**: Online/On-Site Synchronous
- **Maturity Level:** Emerging, with few institutions experimenting
- **Tool Required:** A dedicated AI-powered tool is required

Practical Guide

Step-by-Step Instruction

1. Preparation - Design structured AI prompts tailored to course content (e.g., exercises, code snippets, problem scenarios).
Refine AI outputs to ensure correctness, pedagogical clarity, and alignment with learning objectives.

2. During TA Sessions / Office Hours - Use AI to generate example exercises, hints, and clarifications in real time:

- Verify and edit AI outputs before presenting to students.
- Guide students through step-by-step reasoning using AI-generated materials as a scaffold.

3. Evaluation and Feedback - Compare student performance with and without AI-enhanced TA support. Adjust AI prompts and usage strategies based on observed learning gaps or misconceptions.

Case Study

Tehran Polytechnic & ChatGPT-Augmented TA (2024)

In a Data Structures and Algorithms (DSA) course, teaching assistants (TAs) used ChatGPT as a supplementary tool to improve teaching quality, guided by structured prompts and human verification.

Implementation:

- 40 undergraduates were split into two groups: one with traditional TA support, the other with TA + ChatGPT assistance.
- TAs used structured prompts (problem, traits, algorithm, real-world case, code). ChatGPT-4o generated exercises; ChatGPT-o1 handled advanced reasoning. All outputs were verified and refined before use.
- AI-assisted problem sets and step-by-step explanations guided students through complex topics. TAs facilitated exercises, feedback, and comparisons with the non-AI group.

Impact: Preliminary results suggest that students in the TA + ChatGPT group scored 16.5 points higher on average than the TA-only group ($p < 0.001$). Improvement was most significant in complex topics like recursion and dynamic programming.

Impact Indicators

- **Academic Performance:** Compare exam scores, assignment grades, and topic-specific mastery (e.g., recursion, dynamic programming) between AI-assisted and TA-only groups.
- **TA Efficiency:** Track TA preparation time and ability to provide personalised feedback.

AI-Customised Instructor-Like Feedback

Description

In this methodology generative AI (chatbot/assistant) is trained on course-specific instructor materials (past feedback, model answers, rubrics, exemplar comments) so it can give students formative, instructor-style guidance. The AI acts as a 24/7 “ checkpoint” that echoes course expectations and tone.

- **Suitable Settings**: Online Asynchronous
- **Maturity Level:** Emerging, with few institutions experimenting
- **Tool Required:** A dedicated AI-powered tool is required

Practical Guide

Step-by-Step Instruction

1. Define goals & policy - decide what the bot may and may not do (draft feedback only, no grading; allowed/forbidden content), publish an AI statement in the syllabus.

2. Assemble training corpus - collect past feedback, rubrics, annotated student drafts, exemplar comments, and instructor notes.

3. Design prompts/behaviour - codify tone, depth, and scope (e.g., “give instructor-style formative feedback focused on thesis clarity, evidence, and structure; suggest 2 next steps”).

4. Train / configure the bot - fine-tune or use RAG (retrieve + generate) to ground answers in the course corpus; add guardrails (refuse on policy-violating prompts).

5. Integrate & launch - embed in LMS or provide a clear access point

6. Monitor & QA - spot-check outputs regularly, sample threads for hallucinations/bias, log problematic responses.

Case Study

University of Washington & AI-enhanced Instructor-Student Feedback Loop (2024)

Associate Professor Katy Pearce developed course-specific AI chatbots trained on years of her own assignment feedback.

Implementation:

- Pearce collected past feedback across multiple years of teaching the same assignment and trained a chatbot to approximate her feedback style, tone, and expectations.
- Students submitted a draft and asked the chatbot for feedback.
- The chatbot provided Pearce-style formative guidance on thesis clarity, argument strength, structure, and evidence use.
- Students iterated on their drafts multiple times since the bot “never gets tired.”

Impact: Students who normally avoided office hours or asking for help engaged with the chatbot frequently. Students submitted more polished drafts, reporting that their work had already been “checked” before submission. Further research is needed to test the accuracy of the feedback.

Impact Indicators

- **Feedback Fidelity:** % of AI recommendations that instructors mark as “useful / accurate” in spot checks.

Predictive Analytics

Description

This methodology uses LMS, SIS and advising data to predict engagement and persistence risk, producing risk tiers for early action. Provides course- and programme-level insights with built-in outreach workflows, using institution-specific models designed for transparency, fairness and regular calibration.

- **Suitable Settings**: Online/ On-Campus Asynchronous
- **Maturity Level:** Mature, implemented by a number of institutions
- **Tool Required:** A dedicated AI-powered tool is required

Practical Guide

Step-by-Step Instruction

1. Set goals & guardrails - Decide which outcomes to improve (e.g. attendance, submissions, persistence) and define what counts as high risk.

2. Open dashboard - Scan your class roster for red/amber risk tiers.

3. Drill into profiles - For flagged students, review signals such as withdrawals, inactivity, or assessment trends to plan support.

4. Target outreach - Use built-in email or text to invite to office hours, connect to tutoring, or share resources matched to their needs.

5. Log actions & coordinate - Add notes to the shared record.

6. Monitor & iterate - Recheck indicators weekly, track improvements, adjust thresholds or messaging, and address common issues in class.

Case Study

Austin Community College & Civitas Learning (2023)

At Austin Community College, leaders adopted the Civitas Learning Student Impact Platform to streamline case management, embed predictive analytics into advising, and actively engage faculty in outreach.

Implementation:

- The faculty adopted the Student Impact Platform to unify SIS, LMS, and support data.
- The faculty shifted to case-management advising with predictive scores to prioritise at-risk students.
- Dynamic groups and built-in messaging for targeted outreach were used.
- Faculty engaged in co-designing alerts and major-specific support, with staff trained to follow consistent workflows and track key KPIs.

Impact: Preliminary results suggest that ACC achieved a 4.1 percentage-point increase in fall-to-spring persistence, alongside a 13% rise in two-year completion and a 25% increase in certificates awarded, particularly short-term credentials. The intervention also streamlined systems by unifying scheduling, messaging, and note-keeping, while fostering stronger faculty engagement through alerts and targeted outreach to specific majors and cohorts. More research is needed to assess long-term impact.

Impact Indicators

- **Completion outcomes:** Student assignment completion rates; certificates and credentials awarded.
- **Advising efficiency:** Caseload coverage (% of students seen); average response time to alerts; notes logged per student.

AI-Enhanced Faculty Feedback

Description

This approach integrates AI tools (e.g., ChatGPT) into traditional classroom assessment techniques (like the 1-minute paper or muddiest point exercise) to quickly summarise student reflections on key concepts and areas of confusion. By identifying common themes in real time, instructors can adapt their teaching, address misconceptions, and foster student engagement.

- **Suitable Settings**: Online/ On-Campus Synchronous
- **Maturity Level:** Emerging, with few institutions experimenting
- **Tool Required:** A dedicated AI-powered tool is required

Practical Guide

Step-by-Step Instruction

1. Create the Prompt - Focus on a lecture, activity, or discussion. Example: What was the most important idea from today's class? What concept was most difficult to understand?

2. Collect Responses - Use Google Docs, a form, or LMS (anonymous if possible). Option: gather mid-class for live discussion.

3. Analyse with AI - Paste responses into ChatGPT with a prompt: Summarise student feedback. List 3 key takeaways and 3 areas of confusion.

4. Review & Respond - Compare AI output with teaching goals. Clarify confusing concepts, add resources, or discuss results in class so students learn from each other.

Case Study

Wharton Business School Emerging Methodology (2023)

This emerging methodology, proposed by a Wharton Business School professor, provides a structured way to use AI for feedback, though it is not yet classroom-tested.

Implementation:

- Instructor selects a focus (lecture, activity, or discussion).
- Students respond to short reflective prompts (e.g., What was the most important idea from today's class? What concept was most difficult to understand?) via Google Docs, LMS, or forms.
- Instructor submits the set of responses to AI, requesting a summary of 3 key ideas students found important and 3 areas of confusion.
- Faculty reviews AI's output, checking alignment with course goals and spotting unexpected gaps.
- Instructor addresses confusion by clarifying concepts, sharing resources, or facilitating peer discussion using the AI summary as a conversation starter.

Impact: Yet to be examined

Impact Indicators

- **Student Understanding & Retention:** % of students who can correctly explain key concepts in subsequent classes or assessments.
- **Efficiency Gains for Faculty:** Time saved in reviewing and synthesising student responses.

AI-Supported Asynchronous Discussion Board

Description

This methodology uses AI to support asynchronous discussion boards by improving writing quality, originality, and structure, and by helping generate ideas. Students critique and expand on AI outputs, creating richer discussions.

- **Suitable Settings**: Online Asynchronous
- **Maturity Level:** Emerging, with few institutions experimenting
- **Tool Required:** A dedicated AI-powered tool is required

Practical Guide

Step-by-Step Instruction

1. Design the activity - Set weekly post/response requirements, use open-ended prompts, and give clear rules for AI use.

2. Guide students - Explain AI as a support tool, not a substitute. Share examples of strong, reflective posts.

3. Launch discussions - Students use AI to brainstorm, then post with their own analysis.

4. Monitor and connect - Track participation and quality, and highlight strong contributions in class.

5. Feedback and reinforce - Give feedback on depth and originality, address over-reliance on AI, and use themes to guide teaching.

Case Study

East Carolina University & Chat GPT-enhanced online discussions (2024)

At East Carolina University, instructors noted procrastination and surface-level posts in graduate courses, limiting critical thinking and collaboration. To address this, ChatGPT was integrated into weekly asynchronous discussions.

Implementation:

- Students followed clear rules: no copy-pasting, they were required to critique and build on AI outputs, submitting conversations alongside posts for accountability.
- Activities were framed by Kolb’s Experiential Learning Cycle: connecting prompts to experience, using ChatGPT for diverse perspectives, evaluating AI responses, and extending peer discussions.
- Data on the impact of the intervention came from Canvas logs, surveys, and questionnaires on critical thinking.

Impact: Preliminary results suggest that participation increased on discussion boards, though a few students relied only on copy-paste. Students also reported that AI responses were sometimes repetitive or overly long, limiting depth. Further testing is needed to assess and adapt the methodology.

Impact Indicators

- **Response ratio:** % of posts that are replies to peers (measuring interaction, not just solo posting).
- **Integration of AI + personal reasoning:** evidence that students critique, refine, or expand on ChatGPT responses rather than copy-paste.

AI-Generated Prompts for Synchronous Discussions

Description

This methodology uses generative AI to create engaging discussion prompts for asynchronous online courses. AI generates multiple open-ended prompts aligned to course objectives and Bloom's Taxonomy. Instructors then refine and customise these prompts to spark deeper student engagement, critical thinking, and meaningful peer-to-peer dialogue.

- **Suitable Settings**: Online Synchronous
- **Maturity Level:** Mature, implemented by a number of institutions
- **Tool Required:** A dedicated AI-powered tool is required

Practical Guide

Step-by-Step Instruction

1. Define objectives - Clarify the learning outcomes (critical thinking, application, reflection).

2. Provide context - Share course materials, themes, or sample objectives with the AI.

3. Generate prompts - Ask AI to create 5–10 open-ended prompts requiring analysis, evaluation, or synthesis. Review prompts for clarity, alignment, and level of cognitive demand.

4. Deploy in LMS - Post selected prompts in discussion boards; set expectations for responses (e.g., peer replies, citations, reflection).

5. Integrate into teaching - Use top discussion threads to enrich lectures or live sessions.esign the activity.

Case Study

Lamar University & ChatGPT-generated discussion prompts (2024)

Lamar University faced the challenge of limited student engagement in online discussion boards. Prompts often felt generic, resulting in shallow contributions, low participation, and missed opportunities for critical dialogue. Faculty also found creating effective prompts to be time-consuming and inconsistent in quality.

Implementation:

- Lamar adopted Microsoft Copilot as part of its online learning ecosystem.
- Instructors followed a structured approach: defining learning goals, feeding course context into Copilot, and refining AI outputs based on Bloom's Taxonomy.
- Prompts were then deployed in asynchronous forums, encouraging students to integrate course materials, external sources, and personal experiences.

Impact: Preliminary results suggest AI-enhanced posts reflected deeper critical thinking and application of course concepts. Further research is needed to asses the engagement impact.

Impact Indicators

- **Post quality trends:** Growth in average length, citations, and references to course material.
- **Peer interaction:** Number and quality of replies or follow-ups per thread.

AI-Mediated Peer-to-Peer Discussions

Description

AI-mediated peer-to-peer discussion leverages artificial intelligence to guide structured conversations between students. The AI serves as a neutral facilitator, monitoring dialogue for civility, relevance, and evidence-based reasoning. It can provide prompts, highlight common ground, and ensure that discussions remain productive.

- **Suitable Settings**: Online/On-Campus Synchronous
- **Maturity Level:** Mature, implemented by a number of institutions
- **Tool Required:** A dedicated AI-powered tool is required

Practical Guide

Step-by-Step Instruction

1. Assignment Setup - Instructor selects a discussion topic and sets deadlines, participation requirements, and minimum interaction duration.

2. Student Registration & Pre-Survey- Students register with school credentials and complete a pre-chat survey capturing opinions and viewpoints.

3. Automatic Pairing - AI pairs students to maximise diversity of perspectives; in cases of agreement, one may be assigned a counter-argument role.

4. AI-Guided Discussion - Students engage in chat sessions while AI monitors conversation. The tool:

- Nudges rephrasing of hostile or offensive language
- Prompts clarification of ambiguous statements
- Highlights evidence or logical fallacies
- Suggests common ground

5. Post-Chat Assessment - Students complete a short quiz to assess comprehension and reasoning.

Case Study

Carnegie Mellon University and Sway (2024)

Carnegie Mellon University (CMU) implemented Sway, an AI-mediated peer discussion platform, in courses within the Dietrich College of Humanities and Social Sciences. Sway uses an AI “Guide” to facilitate civil, evidence-based discussions between students.

Implementation:

- Students logged in with university credentials and were briefed on rules, deadlines, and conduct.
- The platform paired students (sometimes with opposing views), monitored tone, suggested rewording, corrected inaccuracies, and prompted evidence use. Chats stayed private, while instructors received aggregated data.
- Students took short quizzes, and instructors reviewed analytics to spot trends, misunderstandings, and engagement patterns.

Impact: Preliminary results suggest that students engaged more freely in debates, including topics they might have otherwise avoided due to sensitivity or social pressure. They demonstrated greater use of evidence-based reasoning and more constructive argumentation.

Impact Indicators

- **Quality of Interaction:** Frequency of AI interventions, number of rephrased messages, and evidence-based contributions.
- **Critical Thinking Development:** Depth of arguments, counterargument effectiveness.

AI-Moderated Breakout Groups

Description

This methodology is based on the group discussion format where AI actively supports the process by surfacing prompts, monitoring equity of participation, and assessing conversations against rubrics and providing target feedback.

- **Suitable Settings**: Online/On-Campus Synchronous
- **Maturity Level:** Mature, implemented by a number of institutions
- **Tool Required:** A dedicated AI-powered discussion platform is required

Practical Guide

Step-by-Step Instruction

1. Define outcomes and design - Start with the learning goals. Build modules around real-world scenarios and prompts aligned with those outcomes.

2. Provide pre-work - Provide content with background context.

3. Run engaging group sessions - In small groups, students work through prompts, cases, and multimedia. Students lead their own conversations, using evidence to defend ideas and respond to peers.

5. Capture and assess with AI - The platform records transcripts and evaluates contributions against rubrics. Faculty receive individual and group-level performance data.

6. Deliver targeted debriefs - Instructors use highlighted student comments and rubric insights for assessment and analysis.

Case Study

Michigan State University and Breakout Learning's NextBook (2024)

In BUS200, a foundational business course with over 1,200 students annually, MSU faced major challenges: low participation, high grading workload, and outdated teaching materials. Faculty adopted Breakout Learning's NextBook to transform engagement.

Implementation:

- Nextbook replaced static textbooks with interactive, AI-powered modules.
- Students completed pre-work (podcasts or PDFs) before class to ensure readiness.
- In small groups, students engaged with each other in a discussion.
- AI monitored and facilitated equitable participation, assessed discussions against rubrics, and provided real-time analytics to faculty.

Impact: Preliminary results suggest the tool enhanced engagement, trust, and inclusivity. Engagement rose by 35%, trust in AI facilitation by 59 points, and belief in balanced discussions from 41% to 100%. After use, all students reported greater understanding, comfort in contributing, and confidence in collaboration. Long term impact is yet to be examined.

Impact Indicators

- **Participation footprint:** % of students making at least one contribution in the discussion
- **Question-asking:** frequency and depth of peer-to-peer questions (clarification, extension, critical inquiry).
- **Reciprocity of contributions:** proportion of comments that reference or build on another student's input

AI-Generated Multi-Level Explanations

Description

This approach uses AI to generate multiple explanations of the same concept at varying levels of complexity, helping instructors tailor content to students' prior knowledge and learning needs. Instructors can prompt AI to simplify, expand, or restructure explanations step-by-step, add analogies, or connect new ideas to prior topics.

- **Suitable Settings**: Online Synchronous
- **Maturity Level:** Mature, implemented by a number of institutions
- **Tool Required:** A dedicated AI-powered tool is required

Practical Guide

Step-by-Step Instruction

1. Select a concept - Identify the topic students often struggle with or that requires multiple levels of explanation.

2. Prompt the AI - Ask the AI to produce a clear explanation tailored to your students' level (e.g., "Explain X for first-year college students with no background knowledge").

3. Refine output - Request the AI to refine the output based on the rubric.

4. Vet the explanation - Review for accuracy, clarity, and relevance. Edit as needed.

5. Deploy in teaching - Integrate into lectures, study guides, or assignments.

6. Encourage active use - Ask students to compare explanations, rephrase in their own words, or identify gaps.

Case Study

University of Michigan & Wolverine Learning (2024)

The University of Michigan faced a challenge: how to make complex academic content more accessible and engaging for students across its Ann Arbor, Dearborn, and Flint campuses. Faculty sought a solution that could support diverse learning needs, improve study habits, and help students make better use of academic resources. To address this, the university introduced the **Wolverine Learning Assistant**, an AI-powered platform designed to transform student interaction with coursework.

Implementation:

- Built within the Maizey system and GenAI prompt library by Nick Gasper, serving students on all three campuses.
- Uses a Feynman-inspired framework with clear, step-by-step explanations, analogies, and practice exercises.
- Designed as a general learning resource across disciplines.

Impact: Preliminary results suggest that students gained clearer comprehension of complex topics through structured explanations, engaged more actively with personalised support, and demonstrated improved study habits and academic performance.
Further research is required.

Impact Indicators

- **Clarity & Comprehension:** % of students who can accurately restate the concept in their own words.
- **Knowledge Retention & Transfer**: Ability to apply the concept in a new context.

AI-Created Engaging and Relevant Content

Description

This approach uses AI to create many, diverse, examples of a single concept so students abstract the underlying principle (not the surface details). Then, deploy those examples in class and online to build understanding, memory anchors (stories/analogies), critical comparison, and transfer (applying the concept in new contexts).

- **Suitable Settings**: Online/ On-Campus Synchronous
- **Maturity Level:** Emerging, with few institutions experimenting
- **Tool Required:** A dedicated AI-powered tool is required

Practical Guide

Step-by-Step Instruction

Select a concept - Choose one core idea students often misinterpret.

Prompt the AI - Use: “Act as an example generator. Ask me the concept + student level. Produce six examples: (1) everyday life, (2) discipline-neutral, (3–4) subject-specific, (5) edge case, (6) misconception [tricky]. Keep each 3–5 sentences.” Request extra variety or new facets (e.g., X, Y, Z).

Vet examples - Check for clarity, accuracy, and variety. Keep the best 6–8 and label (edge case, tricky).

Deploy in teaching - Use examples in class, study materials, or assignments.

Encourage practice - Have students identify, compare, and create new examples in fresh contexts.

Case Study

Wharton Business School Emerging Methodology (2023)

This emerging methodology, proposed by a Wharton Business School professor, provides a structured way to integrate AI into lesson preparation, though it is not yet classroom-tested.

Implementation:

- Instructor picks a core idea often misinterpreted.
- AI generates examples across contexts (everyday, neutral, subject-specific, edge case, misconception).
- Instructor requests varied facets, levels (Beginner/Core/Advanced), or formats (story, dialogue, data).
- Faculty reviews for accuracy, clarity, and variety, keeping the best set.
- Students identify fitting examples, compare them, and create their own.

Impact: Yet to be examined

Impact Indicators

- **Concept articulation:** % students meeting “proficient” on explain-in-own-words rubric.
- **Improvement quality:** Specific, concept-aligned revisions

AI Tutor

Description

An AI tutor is a course-integrated, student-facing assistant (chat, sidebar, mobile app, or an agent) that provides on-demand, scaffolded learning support: explanations, worked examples, practice problems, and reflective prompts.

- **Suitable Settings**: Online Asynchronous
- **Maturity Level:** Mature, implemented by a number of institutions
- **Tool Required:** A dedicated AI-powered tool is required

Practical Guide

Step-by-Step Instruction

1. Define goals & limits - Specify supported skills (problem solving, exam prep, reflection) and exclusions (grading, test answers). Publish an AI use policy.

2. Choose architecture - Select RAG or fine-tuned model; add integrity modes and tracking. Prepare content: Upload syllabi, notes, rubrics, and FAQs to reduce errors.

3. Design pedagogy - Use scaffolded flows (explain → hint → example → practice → feedback) with reflection and human support.

4. Add guardrails & UX - Provide citations, flag low confidence, refuse off-scope queries, ensure LMS/mobile access.

5. Pilot & evaluate - Run with a small cohort, using logs, surveys, and tests.

6. Monitor & QA - Check for errors, bias, and alignment; keep humans in the loop.

Case Study

Professor Leodar & Nanyang Technological University (2024)

Professor Leodar is a custom-built Retrieval-Augmented Generation (RAG) chatbot designed for the MS0003: Introduction to Data Science and AI course at NTU. Unlike generic chatbots, it retrieves answers directly from course materials and updates weekly with new exercises and solutions.

Implementation:

- To train the chatbot, weekly lecture notes, assignments, and solutions were uploaded to the chatbot.
- Students used it anytime, especially before exams.
- Workflow was as follows: Ask questions → chatbot retrieved cited answers → students iterated for practice and clarification.
- The tool was framed as supplemental support; instructors did not grade work.

Impact: According to preliminary results, 79% reported clearer explanations and improved application of course concepts. Students expressed interest in expansion to other courses (64% strongly agreed). International students requested multilingual options.

Impact Indicators

- **Mastery rate -** % of students reaching mastery thresholds on practice modules.
- **Practice completion -** number of practice problems attempted per student.

AI-Supported Interactive Reading

Description

AI-powered interactive reading tools help students focus attention, scaffold comprehension, and turn solitary reading into scaffolded, collaborative sense-making. They do this by making the topics, passages, and peer thinking visible, reducing cognitive load and encouraging both shy and active students to contribute.

- **Suitable Settings**: Online Synchronous/ Asynchronous
- **Maturity Level:** Mature, implemented by a number of institutions
- **Tool Required:** A dedicated AI-powered tool is required

Practical Guide

Step-by-Step Instruction

1. Select & set goals - Instructor chooses a paper and 2–5 focus topics.

2. Model strategy - Instructor demonstrates reading and AI annotation tools.

3. Skim & map - Students skim key sections to outline structure.

4. Annotate & explain - Students highlight passages linked to topics and add short notes.

6. Assess & adjust - Instructor reviews annotations (manually or with AI).

Case Study

Central State University & Feedbackfruits (2020)

At Central State University, Dr. Anderson noticed that as courses moved into hybrid and online formats, students were becoming less socially engaged with the material and with each other. This became especially clear when many students failed to complete reading assignments satisfactorily, revealing the lack of interaction and accountability.

Implementation:

- Course readings were uploaded with embedded prompts, allowing students to highlight, annotate, and ask questions collaboratively. This turned reading into an active, shared task rather than an individual activity.
- Students then reviewed sample annotations, evaluating their depth and relevance. This helped them recognise what counts as high-quality engagement with texts.
- Participation in both steps was graded.

Impact: Preliminary results suggest that students reported greater engagement. Shy or passive students became active due to annotation and video questions. However, further research is required.

Impact Indicators

- **Engagement:** % of students submitting annotations/questions in readings
- **Collaboration & discourse:** Diversity of contributors (shy vs. frequent participants)

AI Real-Time Feedback for Students

Description

This methodology uses AI chatbots to provide students with instant, formative feedback. Instead of waiting for instructor comments, students can iterate quickly, receiving guidance on the input. The instructor's role shifts from being the sole feedback provider to scaffolding how students interpret and act on AI feedback.

- **Suitable Settings**: Online Asynchronous
- **Maturity Level:** Mature, implemented by a number of institutions
- **Tool Required:** A dedicated AI-powered tool is required

Practical Guide

Step-by-Step Instruction

1. Set scope - Define the writing task (essay, report, reflection) and aspects AI should address (e.g., grammar, structure, argument).

2. Prepare prompts - Provide students with ready-to-use AI prompts (e.g., "You are a writing coach. Give feedback on clarity and argument flow without rewriting.").

3. Guide use - Instruct students to seek feedback on one or two dimensions at a time and ask follow-up questions.

4. Revise & reflect - Require students to note three changes made from AI feedback and reflect on what they accepted, rejected, or adapted.

5. Monitor & support - Review samples of AI feedback for quality and teach into common issues.

6. Reinforce transfer - Encourage students to apply feedback skills independently in later drafts.

Case Study

Chinese University of Hong Kong (CUHK) & Learnalytics (2023)

At CUHK, engineering students struggled with research writing, especially capstone reports, and faculty lacked capacity for individual feedback. To address this, researchers introduced Learnalytics, a generative AI-based automated writing evaluation system.

Implementation:

- Students uploaded drafts over a 15-week semester.
- Automated comments on grammar, vocabulary, coherence, organisation, referencing, and style were provided. Additionally, the tool gave suggestions on missing components.
- Students revised drafts using feedback, sometimes combining Learnalytics with external AI tools.
- Researchers tracked engagement through screen recordings, draft comparisons, and interviews.

Impact: Preliminary results suggest that some students concentrated on surface-level issues such as grammar and word choice, engaging less with higher-order feedback. Others showed a tendency to rely on AI for direct rewriting, which reduced opportunities for deeper learning. Further research is required.

Impact Indicators

- **Use patterns:** Frequency of AI queries and diversity of feedback dimensions requested.
- **Follow-up questions:** Evidence students probe deeper, not just accept first suggestions.

AI-Generated Memory Retention Exercises

Description

This methodology uses AI to create low-stakes retrieval practice and distributed practice activities that strengthen memory retention. Instead of relying solely on instructor-designed quizzes, AI generates diagnostic questions, practice problems, and review prompts aligned to learning outcomes.

- **Suitable Settings**: Online/On-Campus Asynchronous/Synchronous
- **Maturity Level:** Mature, implemented by a number of institutions
- **Tool Required:** A dedicated AI-powered tool is required

Practical Guide

Step-by-Step Instruction

1. Plan - Choose targeted concepts or skills, decide on retrieval vs. distributed practice, and align to learning outcomes and common misconceptions.

2. Prompt the AI - Ask the AI to generate diagnostic quizzes for retrieval or connections and refresher questions for distributed practice.

3. Vet the Output - Review for accuracy, appropriate difficulty, and meaningful links between new and prior content.

4. Deploy in Class or Online - Use as in-class hinge questions, LMS quizzes, or review tasks, and add reflection prompts for self-assessment.

5. Reinforce & Reuse - Generate new variations for practice, schedule spaced quizzes, and integrate into revision activities..

Case Study

UniDistance Suisse & Magma Learning (2022)

In Fall 2022, UniDistance Suisse piloted MAGMA Learning's AI Tutor, a mobile and web app designed for retrieval practice and spaced repetition, in its bachelor-level Neuropsychology and Neurosciences course.

Implementation:

- The question bank with 800 GPT-3/NLP-generated questions (varied formats) was created. Questions were linked to slides and validated.
- Neural network adapted question selection to each student's grasp.
- 3D concept map showed mastery levels.
- The tool was integrated with online materials, webinars, and Moodle.
- Students averaged 1,800 questions, 7.2 hours, over 26 days.

Impact: Preliminary results suggest that students recalled key concepts weeks or months later. Students integrated new knowledge with prior topics and principles across different contexts and problems. Further research is required to assess long-term knowledge gains.

Impact Indicators

- **Retention scores:** Performance on spaced quizzes compared to immediate recall.
- **Consistency:** Frequency of student interaction with AI-generated review tasks across intervals.

Avatar Teaching

Description

Avatar teaching leverages AI-powered faculty avatars ("digital twins") trained on a professor's lectures, writings, and teaching materials. These avatars mirror the voice, style, and knowledge base of real faculty and are designed to provide 24/7 student support. Unlike simple chatbots, they can follow pedagogical models (e.g., Laurillard's Conversational Framework) to guide reflection, prompt connections to course concepts, and encourage application.

- **Suitable Settings**: Online Asynchronous
- **Maturity Level:** Mature, implemented by a number of institutions
- **Tool Required:** A dedicated AI-powered tool is required

Practical Guide

Step-by-Step Instruction

1. Define purpose - Set module goals, target concepts, and avatar role (Q&A, coaching, recap).

2. Build the avatar - Record faculty samples, upload course materials, and set ethical guardrails (no grading, escalate sensitive issues).

3. Design pedagogy - Script prompts that encourage reflection and exploration, add feedback loops, and enable personalisation or multilingual support.

4. Integrate & launch - Embed in LMS with clear instructions and boundaries on use.

5. Facilitate use - Model good interactions in class, encourage use for prep, revision, and clarification, and route non-academic issues to humans.

6. Evaluate & improve - Track analytics, gather feedback, and update materials to refine performance.

Case Study

ESSEC Business School & Professor's Avatar (2024)

ESSEC Business School launched eProf Cavarretta, an AI avatar of Professor Fabrice Cavarretta, built on a customised GPT to mirror his style and knowledge in management, leadership, and entrepreneurship. It provides students, alumni, and the public with on-demand access to his teachings.

Implementation:

- Academic corpus (research, articles, teaching materials) was uploaded to a customised GPT.
- Instructions ensured responses reflected the instructor's pedagogical style.
- The Avatar was accessible via the school or professor's website.
- Students used it for clarifying course concepts, alumni refreshers, and external insights.

Impact: Students gained 24/7 access to Cavarretta's expertise without adding to his workload, while alumni and external audiences could continue engaging with his teachings at scale. Further research on long-term impact is needed.

Impact Indicators

- **Conceptual understanding:** Student ability to explain/apply key frameworks after avatar use.
- **Quality of submissions:** Depth of answers when trained by avatar vs. before.

Adaptive Micro Learning

Description

Adaptive micro learning platforms personalise content delivery and practice exercises by using AI-driven analytics, learner modeling, and mastery tracking. Instead of static assignments, students receive dynamic, just-in-time, and individualised tasks that adjust in difficulty, pacing, and scope.

- **Suitable Settings**: Online Asynchronous
- **Maturity Level:** Mature, implemented by a number of institutions
- **Tool Required:** A dedicated AI-powered tool is required

Practical Guide

Step-by-Step Instruction

1. Prepare content - Upload and tag course materials, break into modular units, and use AI tools to generate or structure assessment items.

2. Set up system - Define adaptive pathways with prerequisites and remediation, and integrate with the LMS for delivery and grading.

3. Deploy to students - Students access tutorials, quizzes, or assignments; AI adjusts difficulty, pacing, and sequence based on performance and grasp probability.

4. Monitor & support - Use dashboards to track progress, misconceptions, and risks, and intervene with targeted help.

5. Iterate & improve - Review item performance, reinforce weak areas with spaced practice, and refine modules for future cohorts.

Case Study

Valencia College & Knewton (2022)

At Valencia College, Professor Josh Guillemette has used Knewton Alta in statistics and math courses across online, blended, and face-to-face formats.

Implementation:

- 2–4 Alta weekly assignments, supported by Canvas notes and ~98 instructor-made videos were created.
- Difficulty was adjusted to responses, with prerequisite review and unlimited practice until ~80% accuracy.
- Students were encouraged to “jump in,” use supports when stuck, and benefit from re-instruction after repeated errors.
- The system was applied across formats, paired with OpenStax, though students favoured videos and adaptive tasks over reading.

Impact: Adaptive design aligned with modern learning preferences (short videos, micro practice, feedback loops). More research is required to track long-term knowledge gains.

Impact Indicators

- **Retention:** Long-term performance on revisited concepts (spaced practice)
- **Time-on-task:** Active time spent on modules vs. passive access.

AI-Enhanced Flipped Learning

Description

This methodology uses generative-AI tools (e.g., ChatGPT/Copilot/custom chatbots) to shift first exposure to content before class (summarising, translating, example-hunting, micro-quizzing) and reserve class time for application (problem-solving, presentations, debate).

- **Suitable Settings**: Online/ On-Campus Synchronous
- **Maturity Level:** Mature, implemented by a number of institutions
- **Tool Required:** A dedicated AI-powered tool is required

Practical Guide

Step-by-Step Instruction

1. Define outcomes & guardrails - Set learning goals, approved tools, and rules for attribution and use.

2. Build pre-class kit - Provide a prompting guide, guiding questions, and curated readings or a course-trained chatbot.

3. Pre-class workflow - Students use AI for previews or clarifications, take notes, and prepare 1–2 questions.

4. In-class learning - Run readiness checks and application tasks. Students show how they used or refined AI outputs.

5. Post-class reflection - Collect short reflections with prompt logs or annotated outputs; address common gaps with micro-lessons.

Case Study

NOVA University & ChatGPT facilitated flipped classroom (2025)

NOVA Information Management School piloted tailored generative AI chatbots in a flipped graduate GIS course, aiming to support literature synthesis, concept clarification, and critical use of AI.

Implementation:

- Faculty lectures were replaced by weekly student presentations.
- The chatbot was built with Azure OpenAI, trained on curated academic sources.
- Students used chatbots to summarise and organise readings.
- Class consisted of resentations, chatbot demos, peer debates, and critiques of AI limits.
- Final literature review required structured use of AI with critical reflection.

Impact: Preliminary results suggest that flipped learning with chatbots was rated positively for satisfaction and engagement, though chatbot usefulness scored lower than the flipped format itself. Students found chatbots most helpful for structuring and summarising content, but less effective for deeper critical analysis. Further research is needed.

Impact Indicators

- **Application quality:** Rubric scores on in-class tasks/presentations; problem-formulation clarity (for reverse tests).
- **Over-reliance signals:** Posts that mirror AI phrasing; unchanged draft patterns.

AI Real-time Instructor Coaching

Description

AI-based instructor-delivery feedback uses recorded teaching sessions (audio/video + slides) as input to automated analytics that evaluate presentation quality and pedagogy. Typical outputs include speech-to-text transcripts and captions, talk-time and pacing metrics, filler-word counts, clarity/readability scores, question/interaction detection, slide-text alignment, sentiment/engagement estimates, and short, actionable coaching recommendations.

- **Suitable Settings**: On-Campus Synchronous
- **Maturity Level:** Emerging, with few institutions experimenting
- **Tool Required:** A dedicated AI-powered tool is required

Practical Guide

Step-by-Step Instruction

1. Consent & record - Inform students, get approval, and record sessions with good audio/video (camera, mic, slides).

2. Upload & analyse - Send recordings to an AI tool for transcription and delivery analytics (pace, filler words, clarity, engagement).

3. Review & reflect - Check the automated report with time-stamped highlights; pick 1–3 concrete improvements.

3. Revise & re-test - Implement changes in the next session, re-record, and run analysis again.

4. Optional peer check - Share insights or reports with a colleague for added feedback.

Case Study

Clackamas Community College & Swivl (2019)

Instructor Frank Corona used the SWIVL recording system to produce high-quality lecture videos and classroom recordings to increase active engagement in online Project Management courses.

Implementation:

- Setup: Lightweight kit (tripod + SWIVL base + 4 wireless markers); Setup = 3–5 minutes.
- Recording practice: Tracked presenters while they moved; microphones used for presenters/students during negotiation exercises.
- Post-production: Edited videos and optionally synchronised PowerPoint slides (split-screen); uploaded URLs to Moodle for student access.

Impact: Preliminary results demonstrate that recorded lectures with the SWIVL tool increased student engagement and course enrollment, provided valuable learning resources such as role-play analysis in negotiation classes, and proved to be both reliable and cost-effective. The instructor also identified next steps, including refining editing practices and exploring future use of recordings for analytics or AI-based teaching feedback.

Impact Indicators

- **Instructional variety:** evidence of more active strategies over time (e.g., more questions, use of examples, pauses for reflection).
- **Adoption of feedback:** documented adjustments made in subsequent lectures (shorter segments, clearer slides, more engagement prompts).

AI for Role-Playing

Description

This methodology integrates generative or scenario-trained agents into coursework so students can engage in realistic, dynamic interactions (debates, negotiations, consultations, patient interviews, etc). This turns passive study into active practice, where learners apply knowledge, receive instant feedback, and refine their skills in a safe, repeatable, and adaptive environment.

- **Suitable Settings**: Online Synchronous
- **Maturity Level:** Mature, implemented by a number of institutions
- **Tool Required:** A dedicated AI-powered tool is required

Practical Guide

Step-by-Step Instruction

1. Define outcomes - Select skills to practise (e.g., critical thinking, empathy, technical application) and link them to rubric criteria.

2. Design scenario - Create realistic cases with roles, goals, constraints, and AI personas; choose the interaction channel.

3. Configure & pilot - Ground AI in course content, set rules and rubrics, test runs, and adjust behaviour.

4. Run with students - Give clear instructions and roles, have students engage in role-play, and record transcripts.

5. Feedback & reflection - Provide automated and instructor feedback; students submit short reflections.

6. Debrief & integrate - Review exemplar transcripts in class and connect role-play to course theories.

Case Study

NC State University & Generative AI Role-Playing (2024)

NC State University integrated generative AI into Business 444: Systems Analysis and Design, using the chatbot trained on consulting scenarios and real-world transcripts to build AI literacy, problem-solving, and consulting skills.

Implementation:

- RAG model was trained on curated transcripts and scenarios such as simulated client-consultant conversations tackling business challenges.
- Role-play sessions with real-time feedback and exploration of solutions were conducted.
- Students reflected on strategies, solution design, and AI reliability.

Impact: Students gained hands-on experience in simulated consulting interactions, improving problem-solving and communication skills. Further research is needed to assess long-term impact.

Impact Indicators

- **Knowledge gains:** Pre/post test or quiz scores tied to the scenario's content.
- **Interaction metrics:** Depth of AI–student exchanges (e.g., average length/complexity of responses).

Physical Object-Based AI Simulation

Description

Physical, AI-augmented simulators (such as HAL® S5301) combine robotic physiology, AI-powered speech/conversation, and realistic motor responses to create immersive, high-fidelity training environments.

- **Suitable Settings**: On-campus/ Synchronous
- **Maturity Level:** Emerging, with few institutions experimenting
- **Tool Required:** A dedicated AI-powered tool is required

Practical Guide

Step-by-Step Instruction

1. Define Objectives - Identify hands-on competencies (e.g., stroke recognition, emergency protocols, patient communication).

2. Design Scenario - Select the condition/event and define triggers, cues, and expected learner actions.

3. Set Up Simulator - Configure a simulator's physiology, motor responses, and AI conversational profile to match the scenario.

4. Brief Learners - Provide context and learner roles (e.g., primary nurse, team leader).

5. Run Simulation - Allow students to engage with the simulator in real time.

6. Monitor & Adjust - Instructors observe from a control room, adjusting simulator's responses or introducing new developments.

7. Debrief - After the session, review recordings, performance data, and decision points. Encourage self-reflection and peer feedback.

Case Study

Emory University & HAL® S5301 (2024)

The Emory Nursing Learning Center became the first institution worldwide to install the HAL® S5301. With AI-driven conversational speech and advanced physiological simulation, "Emory HAL" provides life-like patient interactions for nursing students.

Implementation:

- The tool was incorporated into nursing training for emergency, trauma, ICU, and med-surg modules.
- Students practiced communication skills with HAL's AI-driven speech.
- They performed assessments, interventions, and team-based decision-making.
- HAL simulated conditions like stroke symptoms in real time, forcing critical thinking under pressure.
- Instructors configured HAL, observed simulations, and used logs for structured debriefing.

Impact: Students described HAL as more "organic" and lifelike compared to older simulators. Faculty highlighted increased realism, interactivity, and confidence transfer to clinical practice. Further research is needed to assess long-term effects.

Impact Indicators

- **Skill development:** Accuracy and timeliness of decision-making during simulations.
- **Engagement & Immersion:** The number and depth of conversational exchanges between students and HAL.

AI-Enhanced XR

Description

AI-enhanced XR (Extended Reality) tutoring combines immersive virtual environments with AI-driven avatars to create interactive learning experiences. XR-based systems place learners inside a visual, embodied context, making abstract concepts more tangible and fostering deeper engagement.

- **Suitable Settings**: On-campus Synchronous
- **Maturity Level:** Emerging, with few institutions experimenting
- **Tool Required:** A dedicated AI-powered tool is required

Practical Guide

Step-by-Step Instruction

1. Define outcomes - Set knowledge goals (e.g., Renaissance art, cultural history) and link to higher-order skills.

2. Design scenarios - Choose events and scenarios and configure an AI tutor persona.

3. Set up XR - Provide access via XR devices or desktop; embed the tutor in a virtual space.

4. Guide interaction - Teach students to engage through questions and Socratic prompts, exploring varied topics.

5. Reflect - Students submit dialogue transcripts and short reflections on learning and perspective shifts.

6. Debrief - In class, compare insights, discuss interpretations, and connect to course readings.

Case Study

Lindenwood University & Da Vinci AI Tutor (2024)

Lindenwood University's College of Arts and Humanities launched Da Vinci AI, the world's first AI-XR tutor tailored to the humanities. Over 500 students are already using it.

Implementation:

- Students engaged with an AI-driven avatar of Leonardo Da Vinci in an XR environment. The avatar answered questions on art and history, from Renaissance movements to modern cultural references.
- Built-in Socratic prompts encouraged deeper reasoning, while learners explored virtual artworks and contexts.
- Instructors guided use, monitored engagement, and integrated the dialogues into class discussions and assessments.

Impact: Students report high immersion and deeper engagement with course content.
Faculty note that the Socratic questioning leads to critical examination of AI-generated answers rather than passive recall. Further research is needed.

Impact Indicators

- **Knowledge gains:** Pre/post quizzes on art history concepts covered by AI XR.
- **Critical Thinking:** Quality of student–AI interactions

AI Live Captioning, Transcription, Translation

Description

This methodology uses speech recognition and natural language processing (NLP) to generate real-time captions, transcripts, translations. This enhances accessibility, and provides searchable class records.

- **Suitable Settings**: On-Campus Online/ Synchronous
- **Maturity Level:** Mature, implemented by a number of institutions
- **Tool Required:** A dedicated AI-powered tool is required

Practical Guide

Step-by-Step Instruction

1. Integration - Connect AI transcription tools with teaching platforms (Zoom, Engageli, LMS).

2. **Real-Time Use -** Run live captions/transcripts during lectures. Allow students to interact via comments or questions tied to transcript sections.

3. **Post-Class Resources -** Provide searchable transcripts with keywords, summaries, and embedded media. Enable translation for multilingual access.

4. **Analytics & Insights -** Collect engagement data (participation levels, chat/poll activity, speaking time). Monitor real-time and historical patterns.

5. **Evaluation & Scaling -** Measure student accessibility, participation, and satisfaction.

Case Study

California State University & Otter.ai (2022)

In response to the rapid shift toward hybrid and remote learning, CSU rolled out Otter for Education to provide students with real-time, AI-generated lecture notes and transcripts, ensuring accessibility, continuity, and equity in learning.

Implementation:

- Otter was connected to existing teaching platforms (Zoom, LMS, video platforms).
- Faculty used Otter to generate captions and transcripts in live classes; students interacted by commenting directly in the transcript.
- Students searched transcripts with keywords, access auto-generated topic highlights, and viewed embedded media (slides, images).
- Students with hearing disabilities and other accommodations used transcripts as independent study aids.

Impact: Live comments enabled real-time student questions and participation, even in large Zoom lectures. Further research is needed to assess long-term impact.

Impact Indicators

- **Accessibility & Inclusion:** Student satisfaction surveys on accessibility.
- **Engagement & Immersion:** Average number of comments/questions added per transcript.

AI for Inclusive Content Creation

Description

This methodology uses generative AI tools to create, review, and refine course materials with built-in checks for equity, diversity, and inclusivity (EDI).

- **Suitable Settings**: On-Campus Asynchronous
- **Maturity Level:** Emerging, with few institutions experimenting
- **Tool Required:** A dedicated AI-powered tool is required

Practical Guide

Step-by-Step Instruction

1. Define Course Goals - Identify intended learning outcomes and inclusivity priorities.

2. Provide Course Context - Input key details (discipline, level, audience, existing materials).

3. Generate Draft Components - Use AI to create tasks, rubrics, outcomes, or reading suggestions.

4. Run Inclusivity Check - Let AI analyse the balance of sources, representation, and accessibility.

5. Refine and Adapt - Modify outputs to fit disciplinary norms and institutional standards.

6. Integrate into Curriculum - Embed finalised content into syllabi, lesson plans, and LMS platforms.

7. Evaluate and Iterate - Collect student and peer feedback to improve inclusivity over time.

Case Study

UCalgary & SMARTIE (2024)

At the University of Calgary, Dr. Soroush Sabbaghan developed SMARTIE (Strategic Module Assistant for Rubrics, Tasks, and Inclusive Education), a free AI suite that generates course components and provides inclusivity reports. Over 8,000 uses have been recorded, with faculties applying it differently: Engineering focused on inclusivity audits, while Social Work emphasised rubric and task generation.

Implementation:

- Faculty used SMARTIE to generate outcomes, rubrics, tasks, and reading lists aligned with inclusivity.
- Reports flagged gaps in diversity across geography, time, or author background.
- Engineering focused on audits, while Social Work prioritised rubric and task design.
- Educators refined outputs to fit standards before adding them to syllabi and LMS platforms.

Impact: The approach led to greater awareness of inclusivity gaps in curricula. It also enabled faster creation of rubrics, outcomes, and course structures. Further research on the engagement impact is needed.

Impact Indicators

- **Improvement Inclusivity Metrics:** Diversity of sources, balance of perspectives, accessibility features.
- **Faculty Implementation:** Number of courses and faculties actively using AI for design.

AI Learning Management Assistant

Description

This methodology uses AI agents (chatbots, virtual assistants, nudging systems etc) to automate routine administrative tasks, provide just-in-time student support, personalise reminders and study coaching, and free staff for higher-value work.

- **Suitable Settings**: Online Asynchronous
- **Maturity Level:** Mature, implemented by a number of institutions
- **Tool Required:** A dedicated AI-powered tool is required

Practical Guide

Step-by-Step Instruction

1. Define goals - Identify problems to solve (e.g., wait times, attendance, deadlines, accessibility) and set success metrics.

2. Map data - List required systems (LMS, SIS, forums, calendars, support directories) and confirm integrations.

3. Design UX & persona - Choose role (TA, concierge, coach), tone, channels, and escalation paths.

4. Build knowledge base - Curate FAQs, policies, contacts, and course materials; exclude sensitive content.

5. Train model - Configure RAG or fine-tuned responses with guardrails for refusals, citations, and identity checks.

Case Study

Georgia State University & Pounce (2022)

Georgia State University deployed its AI-enhanced chatbot “Pounce” as a student success tool to provide reminders, guidance, and academic support.

Implementation:

- The Pounce chatbot was embedded into the course, complementing existing communication channels such as email.
- About 500 students joined the study, with half receiving chatbot interventions and half serving as a control group.
- Students received targeted text messages about assignments, exams, and deadlines, with interactive features like short practice quizzes.
- Students could reply to messages with questions, which were relayed to instructors for timely responses.

Impact: Students receiving chatbot messages were 16% more likely to earn a grade of B or higher. Students at academic risk showed the largest gains, including increased use of supplemental instruction and higher credit completion.

Impact Indicators

- **Behavioural Impact –** % of students who click/act after a deadline reminder.
- **Implementation rate –** % of courses or users actively interacting with the assistant.

From Practices to Impact

The mere availability of AI tools does not in itself lead to improved student engagement. Their impact depends on how thoughtfully they are designed, implemented, and embedded into teaching and learning processes. Meaningful outcomes are achieved not through access alone, but through intentional integration.

For instance, the effectiveness of AI tutors depends not on their availability but on how they are designed and integrated. When students use AI tutors as their first point of support, opportunities for interaction with faculty and peers may diminish. One way to address this challenge is by deploying institutional AI tutors that provide faculty with oversight of student–AI interactions, offering valuable insights into where students struggle and how they learn. However, encouraging students to shift from mainstream tools such as ChatGPT to institutional alternatives requires thoughtful design that delivers clear added value, for example, by embedding class-specific materials. Similarly, students using AI to summarise pre-class materials may risk superficial engagement. Yet, when guided by well-designed prompts that encourage reflection and interaction, the same tools can foster deeper learning.

These examples illustrate a central lesson: AI in education is not a plug-and-play solution. Institutions must approach adoption with deliberate pedagogical design. Only then can AI enrich student engagement and strengthen the relationships at the heart of learning.

Contributors

The development of this report has been made possible through the generous contributions of experts, practitioners, and institutional partners from across sectors and geographies. We are deeply grateful to all those who shared their insights, case studies, and critical feedback throughout the process.

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Suggested Citation: Digital Education Council, *AI for Student Engagement*, 2025.

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